

What is claimed is:

1. An apparatus for detecting signals of space-time coding based on transmission diversity, comprising:

5 a plurality of correlators for subjecting received signals to de-spread with the same spreading code as a spreading code used in the transmission side to obtain the transmission symbols decoded;

10 a plurality of channel estimators for obtaining channel estimates of slots according to the transmission symbols of pilot symbol intervals from said correlators to determine an average channel estimate of each symbol through linear interpolation and filtering of the channel estimates;

15 a plurality of space-time decoders for decoding the transmission symbols of the two data symbol intervals received from said correlators based on the channel estimates of said channel estimator to detect the data symbols;

20 a plurality of output control devices for comparing the average signal strength and interference of each slot of the received signals with the threshold value to control the output of the data symbol detected by said space-time decoders; and

25 a combiner for linearly combining the detected signals of said space-time decoders multiplied by the control signals of said output control devices.

2. The apparatus as recited in Claim 1, wherein each of

said channel estimator includes:

a slot channel estimator for filtering the pilot symbol to estimate the channel gain, and obtaining the weighted average of the channel estimates of several slots to produce  
5 the channel estimate of the slot;

a linear interpolation circuit for subjecting the channel estimate from the slot channel determiner to linear interpolation to produce the channel estimate of each transmission symbol; and

10 a linear filtering circuit for obtaining the average of the channel estimates of the symbols extracted by the linear interpolation circuit for a given interval to produce the average channel estimate of the transmission symbol.

15 3. The apparatus as recited in Claim 2, wherein the linear filtering circuit reduces the noises contained in the channel estimate extracted by the linear interpolation circuit.

20 4. The apparatus as recited in Claim 3, wherein each of said output control devices includes:

25 an SIR (Signal to Interference Ratio) estimator for estimating SIR based on the instantaneous signal power and average interference power of the corresponding slot measured from the channel estimate and decoded data symbols of one slot interval;

a signal comparison circuit for comparing the SIR estimated by said SIR estimator with a given threshold value

to judge whether the corresponding output signal is approved; and

an output controller for controlling the output according to the decoded symbol multiplied by the result of the signal 5 comparison circuit.

5. A method for detecting signals of space-time coding based on transmission diversity, comprising the steps of:

subjecting received signals to de-spread with the same 10 spread code as used in a transmission side to obtain transmission symbols decoded;

obtaining the channel estimates of the slots according to 15 the decoded transmission symbols to determine the average channel estimate of each symbol through linear interpolation and filtering of the channel estimates;

compensating the transmission symbols based on the channel estimates to detect the data symbols;

comparing the average signal strength and interference of 20 each slot of said received signals with the threshold value to control the output of the decoded data symbols; and

linearly combining the controlled data symbols.

6. The method as recited in Claim 5, wherein the step of obtaining the channel estimates includes the steps of:

filtering the pilot symbol to estimate the channel gain, 25 and obtaining the weighted average of the channel estimates of several slots to produce the channel estimate of the slot;

subjecting the channel estimate from said slot channel determiner to linear interpolation to produce the channel estimate of each transmission symbol; and

5 obtaining the average of said channel estimates of the symbols for a given interval to produce the average channel estimate of the transmission symbol.

7. The method as recited in Claim 6, wherein the step of obtaining the average of the channel estimates reduces the 10 noises contained in the channel estimate.

8. The method as recited in Claim 7, wherein the step of comparing the average signal and interference further includes the steps of:

15 estimating SIR based on the instantaneous signal power and average interference power of the corresponding slot measured from the channel estimate and decoded data symbols of one slot interval;

20 comparing the SIR estimated by said SIR determiner with a given threshold value to judge whether the corresponding output signal is approved; and

controlling the output according to the decoded symbol multiplied by the result of said signal judgment circuit.

25 9. A computer readable recording medium to perform a method of detecting the signals of transmission diversity based on space-time coding, which comprises the steps of:

subjecting received signals to reverse diversification with the same diversity code as used in a transmission side to obtain the transmission symbols decoded:

obtaining the channel estimates of the slots according to  
the decoded transmission symbols to determine the average  
channel estimate of each symbol through linear interpolation  
and filtering of said channel estimates;

decoding the transmission symbols based on the channel estimates to detect the data symbols;

10 comparing the average signal and interference of each slot of said received signals with the threshold value to control the output of the decoded data symbols; and linearly combining the controlled data symbols.